

### FEATURES

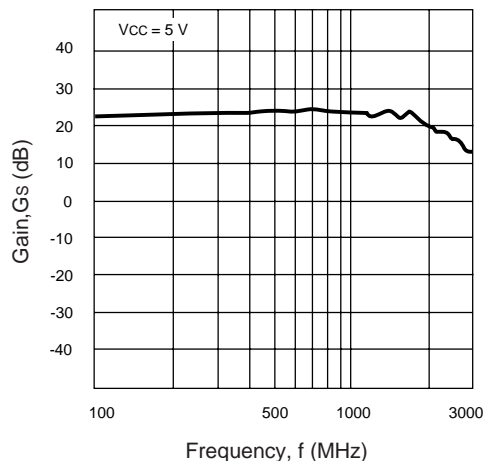
- **HIGH POWER OUTPUT:**  
+19.5 dBm
- **EXCELLENT FREQUENCY RESPONSE:**  
1.7 GHz TYP at 3 dB Down
- **HIGH POWER GAIN:**  
24 dB TYP at 500 MHz
- **SINGLE SUPPLY VOLTAGE:** 5 V

### DESCRIPTION

The UPC1677 is a silicon monolithic integrated circuit designed as a wide-band amplifier covering the HF to UHF bands. The device features high output power, 19.5 dBm typical, high gain, 24 dB typical and operates from a single 5 volt supply. The UPC1677 is available in an 8 lead ceramic flat package (UPC1677B).

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

INSERTION GAIN vs. FREQUENCY



### ELECTRICAL CHARACTERISTICS (TA = 25°C, VCC = 5 V, f = 500 MHz)

PART NUMBER PACKAGE OUTLINE			UPC1677B B08		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I <sub>CC</sub>	Circuit Current (No Input)	mA	63	77	93
G <sub>s</sub>	Small Signal Gain	dB	22	24	26
P <sub>SAT</sub>	Saturated Power	dBm	17.5	19.5	
BW	Bandwidth at 3 dB down below the gain at 100 MHz	MHz	1500	1800	
NF	Noise Figure	dB		6	8
RLIN	Input Return Loss	dB		18	
RLOUT	Output Return Loss	dB		3	
ISOL	Isolation	dB	29	34	
ΔGT	Gain Temperature Coefficient	dB/°C		-0.003	
R <sub>TH (J-A)</sub> <sup>1</sup>	Thermal Resistance (Junction to Ambient)	°C/W			200
R <sub>TH (J-C)</sub>	Thermal Resistance (Junction to Case)	°C/W			50

Note:

1. Mounted on a 5 cm X 5 cm X .16 mm circuit board.

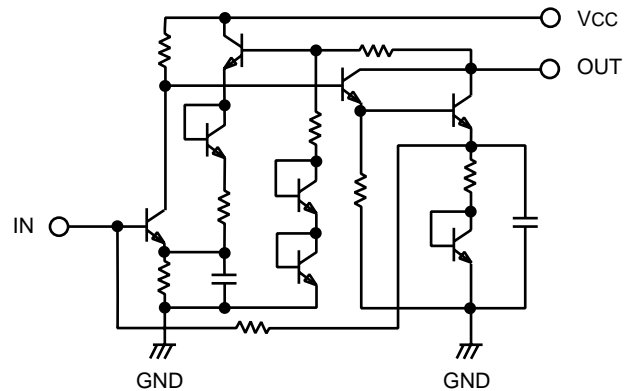
**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>A</sub> = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CC</sub>	Power Supply Voltage	V	6
I <sub>CC</sub>	Supply Current	mA	110
P <sub>T</sub>	Total Power Dissipation <sup>2</sup>	W	1.5
P <sub>IN</sub>	Input Power	dBm	+10
T <sub>OP</sub>	Operating Temperature	°C	-55 to +150
T <sub>STG</sub>	Storage Temperature	°C	-65 to +200

Notes:

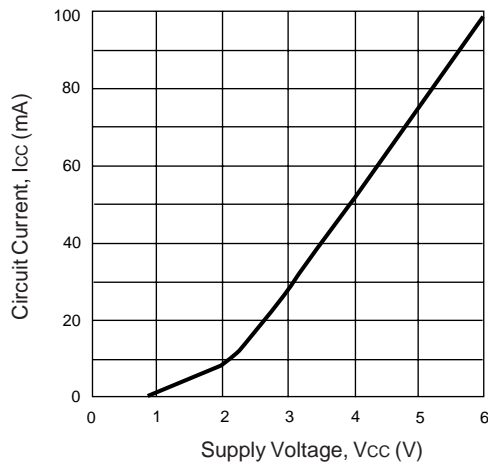
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on 5 cm x 5 cm x 1.6 mm glass epoxy circuit board at T<sub>A</sub> = maximum operating temperature.

**EQUIVALENT CIRCUIT**

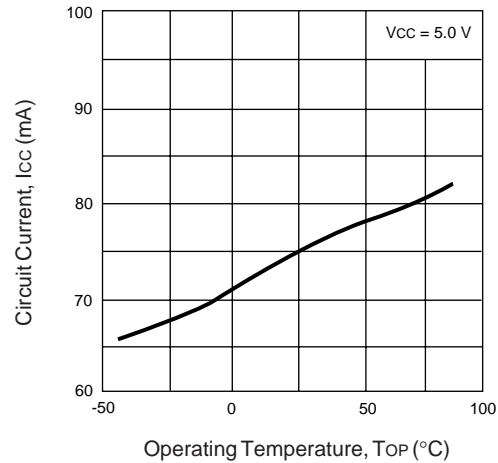


**TYPICAL PERFORMANCE CURVES** (T<sub>A</sub> = 25°C)

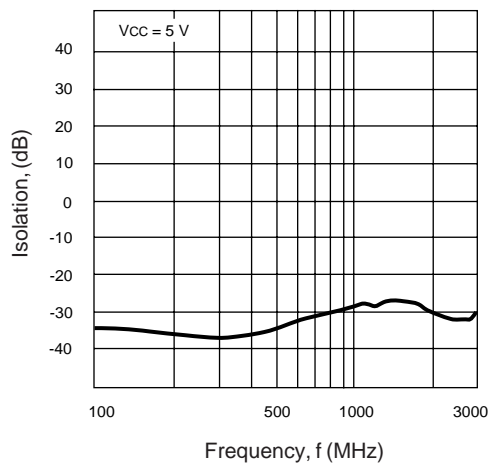
**CIRCUIT CURRENT vs. SUPPLY VOLTAGE**



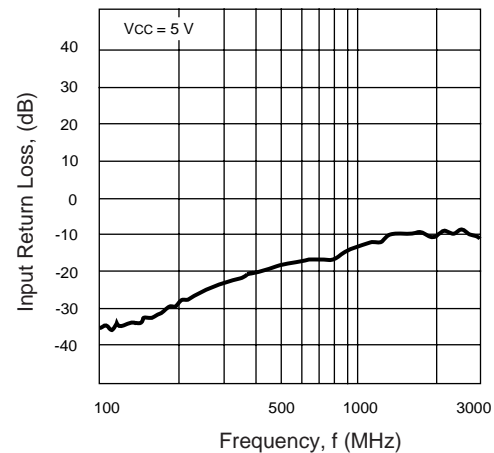
**CIRCUIT CURRENT vs. OPERATING TEMPERATURE**



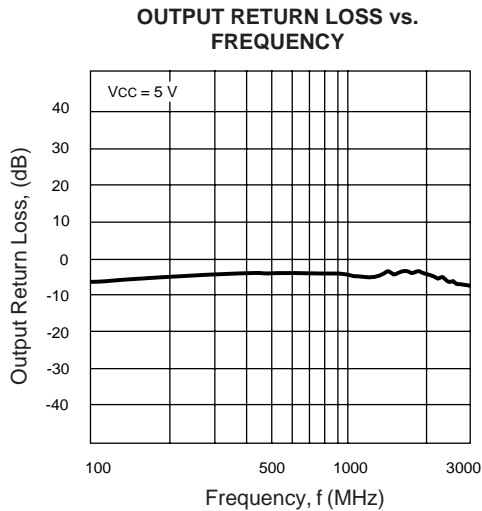
**UPC1677B ISOLATION vs. FREQUENCY**



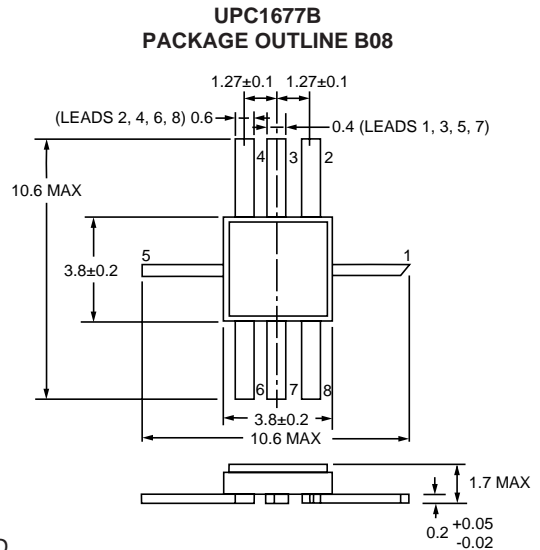
**INPUT RETURN LOSS vs. FREQUENCY**



TYPICAL PERFORMANCE CURVES (TA = 25°C)



OUTLINE DIMENSIONS (Units in mm)

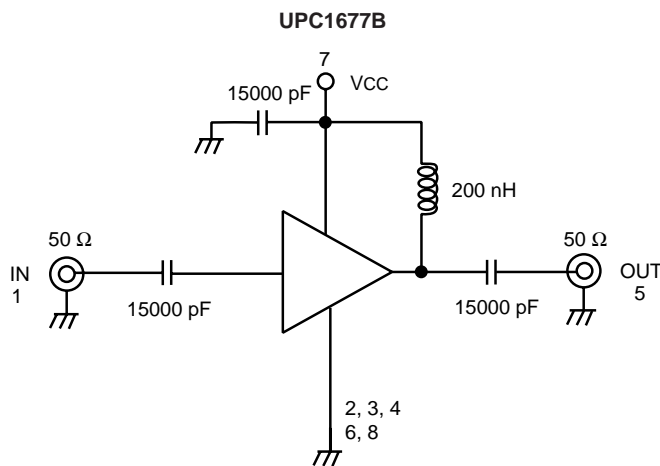


LEAD CONNECTIONS

- 1. Input
- 2. GND
- 3. GND
- 4. GND
- 5. Output
- 6. GND
- 7. Vcc
- 8. GND

Note:  
All dimensions are typical unless otherwise specified.

TEST CIRCUIT



TYPICAL SCATTERING PARAMETERS (TA = 25°C)

UPC1677B

Vcc = 5 V, Icc = 77 mA

FREQUENCY MHz	S11		S21		S12		S22		K	S21 (dB)
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
50	0.093	121.9	10.68	35.8	0.016	33.1	0.721	95.2	1.54	20.6
100	0.044	95.4	13.01	13.1	0.018	18.3	0.577	51.2	1.55	22.3
200	0.034	85.5	14.22	-6.9	0.017	3.7	0.564	13.5	1.53	23.1
400	0.054	75.5	15.61	-37.3	0.014	12.4	0.668	-31.0	1.36	23.9
600	0.095	41.7	15.47	-67.0	0.020	24.3	0.712	-68.1	0.88	23.8
800	0.138	-7.9	14.55	-92.8	0.027	18.7	0.702	-97.3	0.75	23.3
1000	0.181	-47.5	13.79	-116.4	0.033	5.7	0.689	-120.4	0.72	22.8
1200	0.220	-79.1	13.22	-140.4	0.035	-0.8	0.700	-140.9	0.73	22.4
1400	0.272	-107.7	12.91	-163.0	0.039	-13.9	0.707	-159.0	0.71	22.2
1600	0.310	-135.9	12.45	171.8	0.04	-26.5	0.727	-179.9	0.71	21.9
1800	0.339	-158.7	11.12	144.0	0.040	-39.9	0.736	157.4	0.74	21.0
2000	0.369	165.1	10.68	118.8	0.040	-51.2	0.684	134.0	0.91	20.6
2200	0.346	137.6	9.00	93.0	0.038	-65.0	0.615	108.5	1.14	19.1
2400	0.317	112.0	7.58	68.3	0.033	-74.2	0.512	82.3	1.60	17.6

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